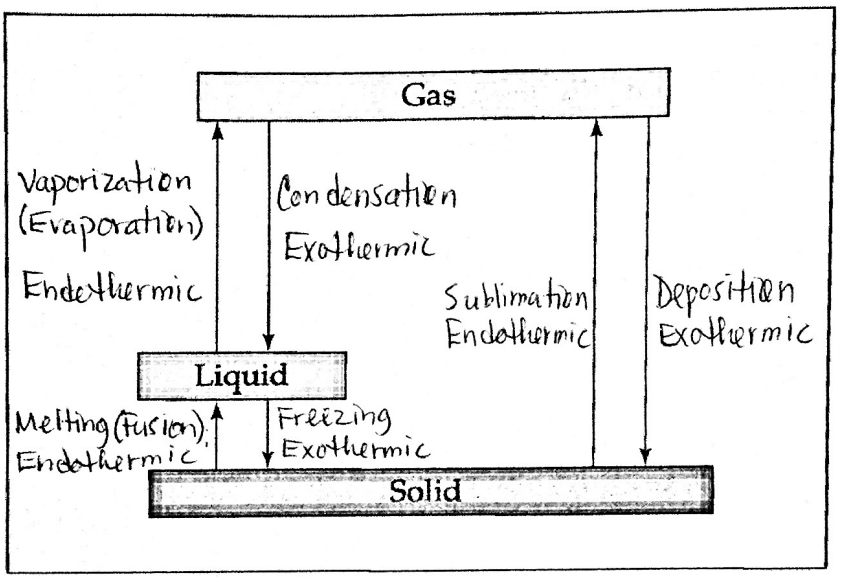
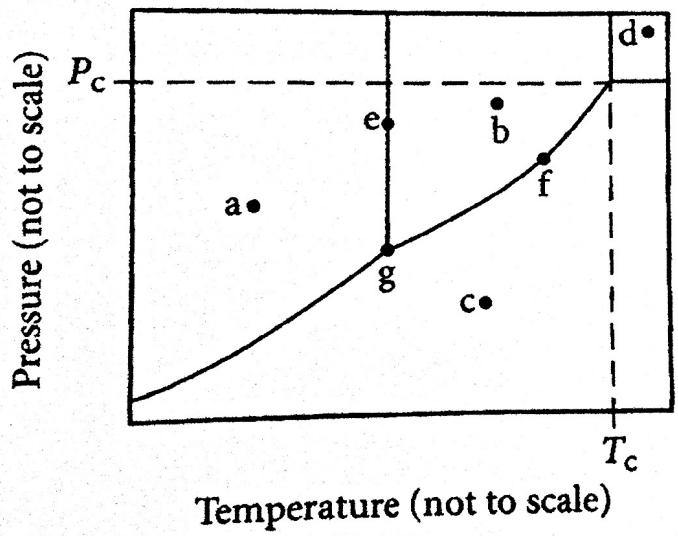
CHM129.01

Phase Changes

1. Identify the following phase changes (shown as the direction of the arros).



2. Consider the following phase diagram. Identify the phases present at points a through g.



a. solid
b. liquid
c. gas
d. supercritical fluid
e. solid & liquid
f. liquid & gas
g. solid, liquid, & gas

3. For each of the following pair of compounds, pick the one with the highest vapor pressure. Explain.

a. CH_3OH or H_2O *Both can H bond

w/ ~4 neighboring molecules

Even though water's so small, it can H bond more & mor efficiently than CH_3OH so it has a lower vapor pressure than CH_3OH. the alcohol would have to have 40–50 g/mol more to match H_2O.

b. $CH_3CH_2CH_2CH_2CH_3$ or $CH_3CH_2CH_2CH_2OH$

pentane butanol

similar mass

pentane : LDF

butanol : LDF, Dipole-Dipole, H Bond

Pentane ⇒ weaker forces ⇓ higher vapor pressure

c. CCl_4 or CH_2Cl_2

Even though CH_2Cl_2 is polar, this trend is dominated by the difference in dispersion forces strength. CCl_4 is heavier than CH_2Cl_2 & has stronger dispersion forces.

	CCl_4	CH_2Cl_2
Molar Mass	153.81 g/mol	84.93 g/mol
Vapor Pressure (@ 20°C)	11.94 kPa	57.3 kPa